

CLAIMS

What is claimed is:

1. A dynamic vibration absorber for a disk player that records and/or reproduces data to and from a disk, comprising:

a deck base;

a deck plate movably supported by said deck base to support a spindle motor that spins the disk; and

a mass body disposed around said deck plate; and

a flexibly changeable connection member that connects said deck plate and said mass body so as to allow a reciprocal action between said mass body and said deck plate,

wherein the reciprocal action of said mass body and said connection member reduces a vibration generated when the disk spins.

2. The dynamic vibration absorber for a disk player of claim 1, further comprising supporting members to support said deck plate at predetermined support points which define a figure,

wherein said mass body is placed at an outermost point from a geometrical center of the figure defined by the supporting points.

3. The dynamic vibration absorber for a disk player of claim 1, further comprising supporting members to support said deck plate at predetermined support points which define a figure,

wherein said mass body is disposed at a predetermined place on said deck plate that has a largest vibration shift from a geometrical center of the figure defined by the supporting points.

4. The dynamic vibration absorber for a disk player of claim 1, wherein said connection member comprises:

a body that is flexibly changeable by an external force and has an internal space to allow compression;

a first flange portion extending from the body to support said mass body; and

a second flange portion extending from the body to fit into said deck plate to be supported by said deck plate.

5. The dynamic vibration absorber for a disk player of claim 4, wherein said deck plate has a connection hole through which the second flange portion extends to be supported by said deck plate.

6. The dynamic vibration absorber for a disk player of claim 4, wherein said mass body comprises a metallic ring having a connection hole having a size that is smaller than a size of the first flange portion so as to be supported by the first flange portion.

7. The dynamic vibration absorber for a disk player of claim 4, wherein said mass body comprises a metallic plate having a connection opening cut from one end to allow insertion above the first flange.

8. The dynamic vibration absorber for a disk player of claim 1, wherein said mass body is disposed above or below said deck plate to reduce a vibration in an upper and a lower direction relative to said deck plate.

9. The dynamic vibration absorber for a disk player of claim 2, wherein said mass body is disposed above or below said deck plate to reduce a vibration in an upper and a lower direction relative to said deck plate.

10. The dynamic vibration absorber for a disk player of claim 3, wherein said mass body is disposed above or below said deck plate to reduce a vibration in an upper and a lower direction relative to said deck plate.

11. The dynamic vibration absorber for a disk player of claim 1, wherein said mass body is disposed on a side of said deck plate to reduce a vibration in a direction perpendicular to the side of said deck plate.

12. The dynamic vibration absorber for a disk player of claim 2, wherein said mass body is disposed on a side of said deck plate to reduce a vibration in a direction perpendicular to the side of said deck plate.

13. The dynamic vibration absorber for a disk player of claim 3, wherein said mass body is disposed on a side of said deck plate to reduce vibration in a direction perpendicular to the side of said deck plate.

14. The dynamic vibration absorber for a disk player of claim 1, further comprising additional mass bodies and corresponding connection members attached to said deck plate.

15. The dynamic vibration absorber for a disk player of claim 1, further comprising a supporting member to support said deck plate at a supporting point, and a viscoelastic member disposed at the supporting point of said deck plate to reduce an effect of an outer shock transmitted between said deck plate and said deck base.

16. The dynamic vibration absorber for a disk player of claim 1, wherein said mass body and said connection member comprise a combined member using an injection molding process.

17. A dynamic absorber for use in a disk player that records and/or reproduces data to and from a disk, which includes a movable plate that supports a spindle motor used to spin the disk, the absorber comprising:

a flexible connection member adapted to be connected to the movable plate; and
a mass body connected to said connection member,

wherein said connection member and said mass body move relative to the movable plate so as to absorb a vibration generated when the disk spins.

18. The dynamic absorber of claim 17, wherein said connection member and said mass body move in a non-parallel direction to an axis of rotation of the disk to absorb a vibration along the axis of rotation of the disk.

19. The dynamic absorber of claim 18, wherein said connection member and said mass body move in a direction perpendicular to the axis of rotation of the disk.

20. The dynamic absorber of claim 17, wherein said connection member and said mass body move in a direction parallel to an axis of rotation of the disk to absorb a vibration moving along the axis of rotation of the disk.

21. The dynamic absorber of claim 17, wherein the dynamic absorber has roughly a same natural resonance frequency as the movable plate.

22. The dynamic absorber of claim 21, wherein said mass body has a mass and said connection member has a spring constant such that the dynamic absorber has roughly the same natural resonance frequency as the movable plate.

23. The dynamic absorber of claim 17, wherein said connection member comprises a body, and
flanges extending outward from the body to support said mass body apart from the movable plate.

24. The dynamic absorber of claim 23, wherein
the body comprises neck portions connecting the body and the flanges,
said mass body is connected to said connection member at one of the neck portions,
and
said connection member is adapted to be connected to a hole in the movable plate at another one of the neck portions.

25. The dynamic absorber of claim 24, wherein the body is wider than the neck portions.

26. The dynamic absorber of claim 23, wherein
the body defines an opening therein, and
the flanges include holes connecting the opening to an area external to the dynamic absorber.

27. A recording and/or reproducing apparatus to record and/or reproduce data to and from a disk, comprising:
a housing;
a deck plate movably supported within said housing, said deck plate having a predetermined frequency;

an optical head movably supported within said housing to record and/or reproduce the data to and from the disk;

a spindle motor supported by said deck plate and which spins the disk; and

a dynamic absorber having a frequency that roughly corresponds to the predetermined frequency of said deck plate so as to absorb a vibration generated when the disk spins.

28. The recording and/or reproducing apparatus of claim 27, wherein the predetermined frequency of said deck plate comprises a natural frequency of said deck plate.

29. The recording and/or reproducing apparatus of claim 27, wherein:
said dynamic absorber comprises:

a flexible connection member connected to said deck plate, and

a mass body connected to the connection member; and

the connection member and the mass body move relative to said deck plate so as to absorb the vibration generated when the disk spins.

30. The recording and/or reproducing apparatus of claim 29, wherein the mass body has a mass and the connection member has a spring constant such that said dynamic absorber has roughly the same natural resonance frequency as said deck plate.

31. The recording and/or reproducing apparatus of claim 29, wherein the connection member comprises

a body, and

flanges extending outward from the body to support said mass body apart from said deck plate.

32. The recording and/or reproducing apparatus of claim 28, wherein said dynamic absorber is attached to said deck plate at a point where said deck plate experiences a maximum vibration amplitude.

33. The recording and/or reproducing apparatus of claim 28, further comprising supporting members to movably support said deck plate within said housing,

wherein said dynamic absorber is attached to said deck plate at a point where said deck plate experiences a maximum vibration shift from a geometric center of a shape defined by attachment points at which said supporting members are connected to said deck plate.

34. The recording and/or reproducing apparatus of claim 28, further comprising supporting members to movably support said deck plate within said housing,

wherein said dynamic absorber is attached to said deck plate at a point farthest from a geometric center of a shape defined by attachment points at which said supporting members are connected to said deck plate.

35. The recording and/or reproducing apparatus of claim 27, wherein said dynamic absorber comprises

flexible connection members connected to said deck plate at corresponding attachment points, and

mass bodies connected to corresponding ones of the connection member; and the connection members and the mass bodies move relative to said deck plate so as to absorb the vibration generated when the disk spins.

36. The recording and/or reproducing apparatus of claim 27, wherein said dynamic absorber absorbs the most vibration volume at roughly a natural frequency of said deck plate.